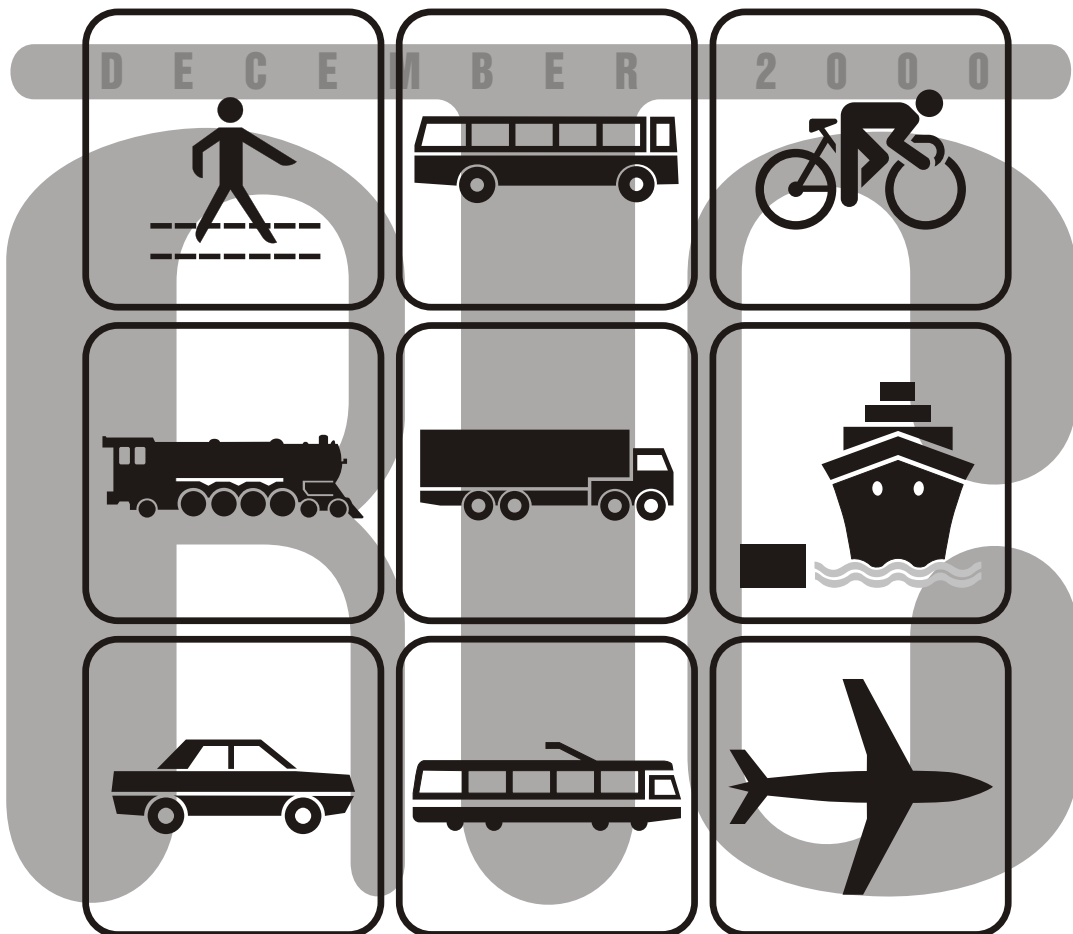


# Metropolitan Transportation Plan for Clark County



**Southwest Washington Regional Transportation Council**

## CHAPTER 3

# IDENTIFICATION OF REGIONAL TRANSPORTATION NEEDS

## INVENTORY OF THE EXISTING REGIONAL TRANSPORTATION SYSTEM

As an introduction to planning for the future development of a regional transportation system, an inventory of the existing system is provided. Also, a brief description of the context for regional transportation planning, with regard to meeting federal requirements and designation of federal transportation area boundaries is described.

### FEDERAL TRANSPORTATION BOUNDARIES

When the Intermodal Surface Transportation Efficiency Act (ISTEA) was passed in 1991, the Act required Metropolitan Planning Organizations (MPOs), such as RTC, to carry out review of several elements of the regional transportation planning program. First, the Act called for review and revision of the federal transportation **Urban Area Boundary** (UAB); a boundary delineating areas that are urban in nature from those that are largely rural in nature. The federal transportation Urban Area Boundary is not to be confused with the Urban Growth Areas being established under the Washington State Growth Management Act (GMA), as described in Chapter 2. The UAB should cover, at a minimum, the area designated by the 1990 Census as "urbanized" by meeting certain population and density criteria. Within Clark County, the Vancouver urban area has a population of over 50,000 and is therefore defined as an urbanized area by the U.S. Census and Camas/Washougal are defined as an urban area or urban place because they have populations of over 5,000 but are not within the main Vancouver urbanized area. Therefore, for federal transportation purposes there is a Vancouver federal transportation Urban Area Boundary and an adjoining Camas/Washougal Urban Area Boundary. (Refer to Figure 3-1; *Transportation Boundaries*).

ISTEA also called for MPO's to establish a **Metropolitan Area Boundary** which marks the area to be covered by MPO regional transportation planning activities and which, at a minimum, has to include the urban area, the contiguous area expected to be urbanized within the next twenty years and in air quality non-attainment areas, such as the Vancouver area, must include the area enclosed by the **non-attainment area boundary** (i.e. the Vancouver Air Quality Maintenance Area). The Vancouver area's classification as a moderate non-attainment area for carbon monoxide and a marginal non-attainment area for ozone resulted in development and submission to the Environmental Protection Agency (EPA) of Air Quality Maintenance Plans for both carbon monoxide and ozone. This has implications for regional transportation planning as the region strives to attain and then maintain national ambient air quality standards. The entire county is enclosed by the Metropolitan Area Boundary established for the Clark County region. (Refer to Figure 3-1; *Transportation Boundaries*).

With a population of over 200,000 the Portland-Vancouver metropolitan area was designated as a **Transportation Management Area** (TMA) by the U.S. Secretary of Transportation. Within TMAs, the MPO has to develop a congestion management system. The RTC Board adopted the Transportation Management Systems at their May 2, 1995 meeting (RTC Board Resolution 05-95-14). The MPO has authority to select, in consultation with the state, projects to receive federal funds (see Chapter 4 for further details).

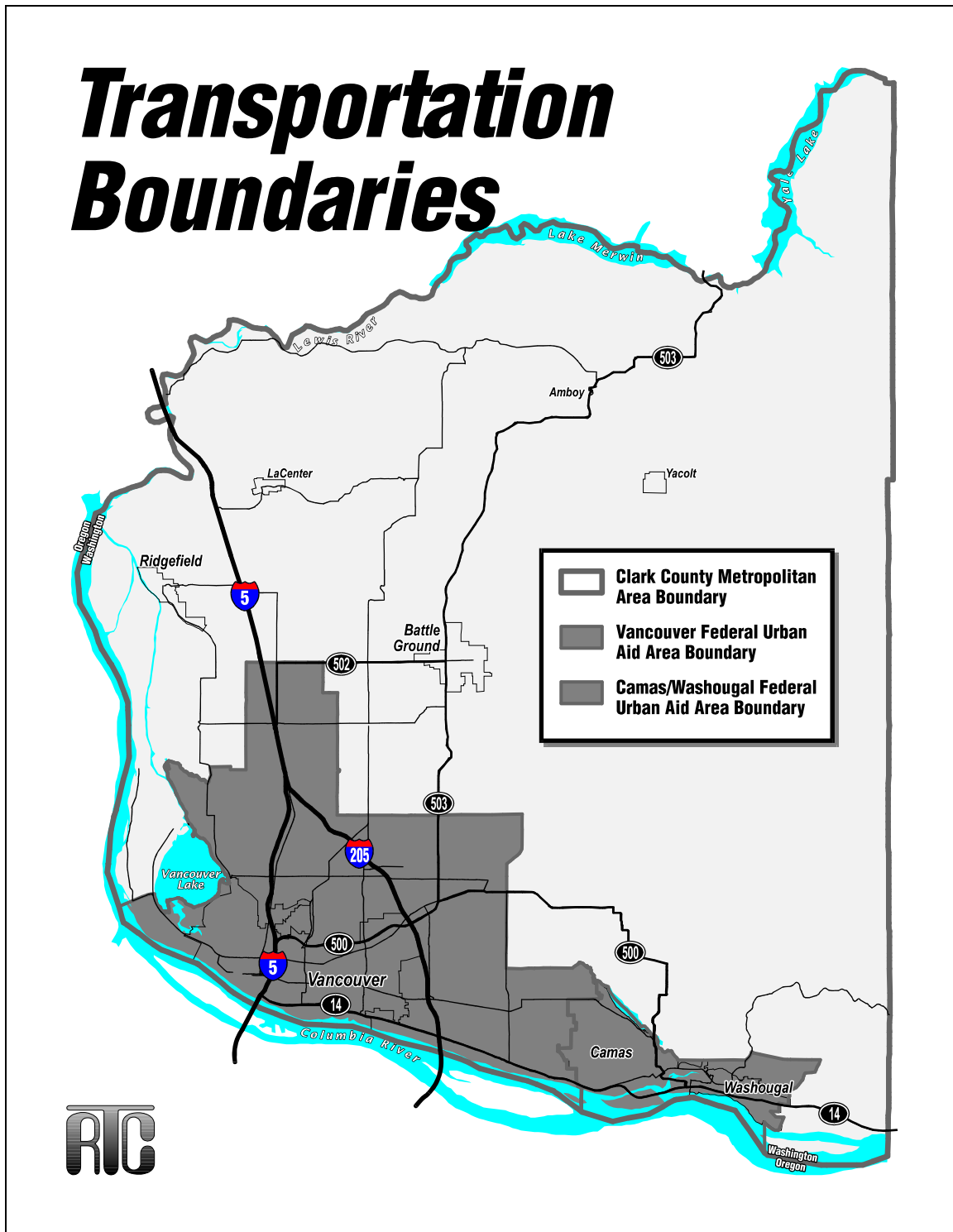
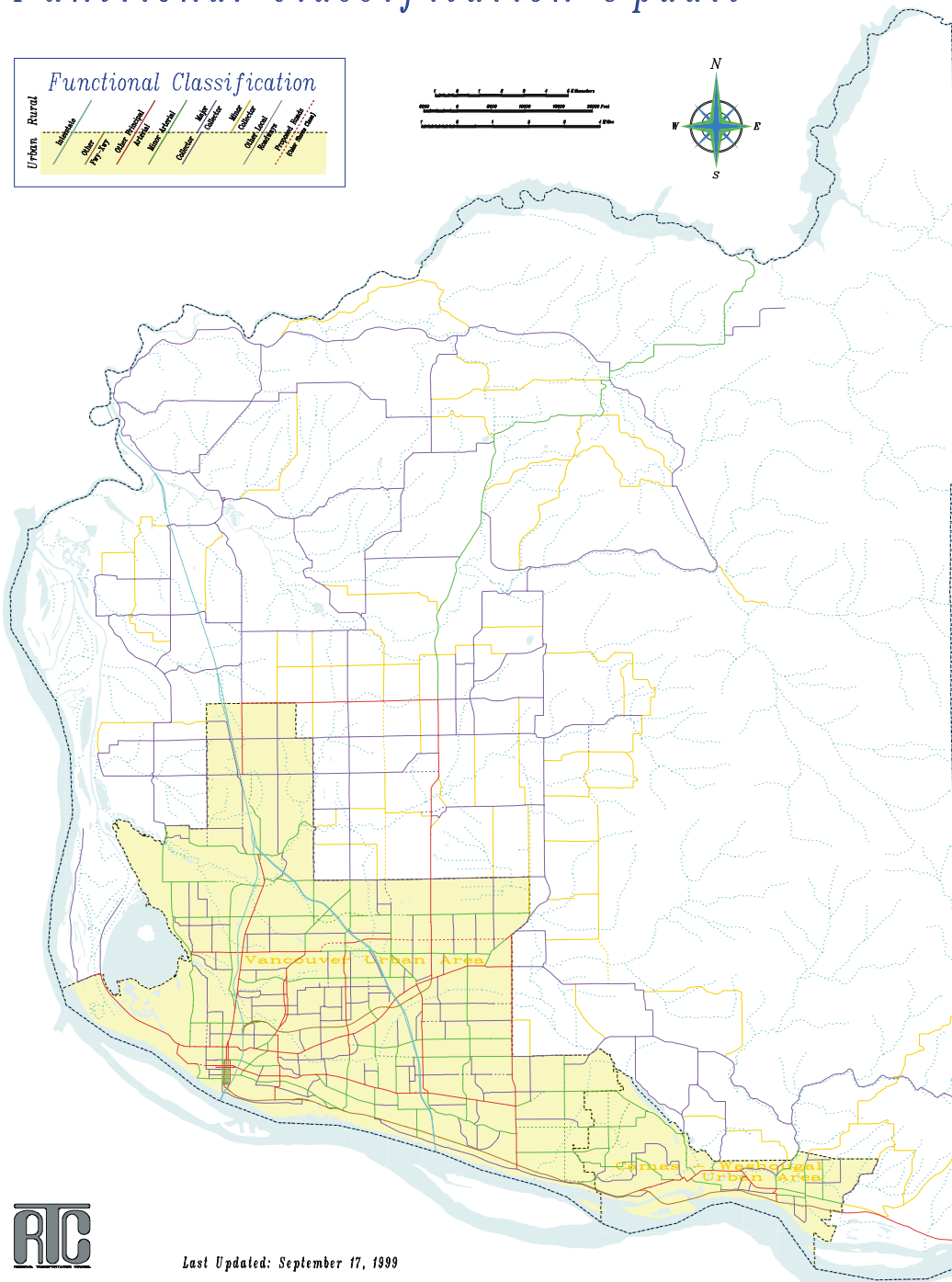
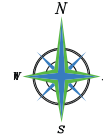


Figure 3-1: Transportation Boundaries

Figure 3-2: Clark County Federal Functional Classification Map

## Clark County Transportation Network *Functional Classification Update*



Last Updated: September 17, 1999

SOUTHWEST WASHINGTON REGIONAL TRANSPORTATION COUNCIL

## FUNCTIONAL CLASSIFICATION OF THE REGIONAL HIGHWAY SYSTEM

Arterials are categorized into a functional classification system; the classifying of highways, roads and streets into groups having similar characteristics for providing mobility and/or land access. Interstate freeways, classified as divided principal arterials, are designed to provide for the highest degree of mobility of large volumes of long-distance traffic, they are not designed to provide for access to land uses. Collector facilities generally provide equal emphasis upon mobility and land use accessibility. Local facilities emphasize access to land uses.

In 1993, to meet the requirements of ISTEA, the Federal Functional Classification system for Clark County roads was reviewed. This review led to a revision of the classification system within some jurisdictions and the result was a county-wide uniform classification system (see Figure 3-2; *Clark County Transportation Network, Functional Classification Update*). In May, 1993, RTC was informed by WSDOT that the revised functional classification system had been approved by the Federal Highways Administration. Since the 1993 approval, minor changes have been made to the federal functional classification system. The changes include re-designation of Burton Road, from Andresen Road to NE 162<sup>nd</sup> Avenue from a collector to minor arterial (MTP, 1996), and re-affirmation of NE 20<sup>th</sup> Avenue/NE 15<sup>th</sup> Avenue from Highway 99 to NE 179<sup>th</sup> Street as a minor arterial. Clark County is now in the process of reviewing classification of certain streets in their system and will be re-classifying following approval of Clark County Arterial Atlas changes by the Board of County Commissioners. The City of Vancouver has requested street re-classifications for: Simpson Avenue (Mill Plain to Fourth Plain) from minor arterial to local and NE 97<sup>th</sup> Avenue (between Mill Plain and NE 18<sup>th</sup> Street) from collector to minor arterial.

As a pre-requisite for review of the functional classification system, the Urban Area Boundary had to be defined (refer to Figure 3-1; *Transportation Boundaries*). Facilities classified as collector or above in urban areas are eligible for federal funding while in the rural area, those facilities classified as major collector and above are eligible. In rural areas, minor collectors are not eligible for federal funding. A description of the urban functional classification categories follows:

### PRINCIPAL ARTERIALS

Principal arterials permit traffic flow through the urban area and between major elements of the urban area. They are of great importance in the regional transportation system as they interconnect major traffic generators, such as the central business district and regional shopping centers, to other major activity centers and carry a high proportion of the total urban area travel on a minimum of roadway mileage. They also carry traffic between communities. Frequently principal arterials carry important intra-urban as well as intercity bus routes.

Many principal arterials are fully or partially controlled access facilities emphasizing the through movement of traffic. Within the category are (1) interstates (2) other freeways and expressways and (3) other principal arterials.

Spacing of principal arterials may vary from less than one mile in highly developed central business areas to five miles or more in the sparsely developed urban fringes.

### MINOR ARTERIALS

Minor arterials collect and distribute traffic from principal arterials to lesser classified streets, or allow for traffic to directly access their destinations. They serve secondary traffic generators such as community business centers, neighborhood shopping centers, multiple residence areas, and traffic from neighborhood to neighborhood within a community. Access to land use activities is generally permitted. Such facilities are usually spaced under two miles apart and in core areas can be spaced at 1/8 to 1/2 mile apart.

### COLLECTORS

Collectors provide for land access and traffic circulation within residential neighborhoods and commercial and industrial areas. They distribute traffic movements from such areas to the arterial system. Collectors do not handle long through trips and are not continuous for any great length.

### LOCAL STREETS

Local streets provide direct access to abutting land and access to the higher classification facilities. They offer the lowest level of mobility and usually contain no bus routes. They are not intended to carry through traffic but make up a large percentage of the total street mileage.

Rural roads consist of those facilities that are outside of urban areas. They too are categorized into functional classifications:

### RURAL PRINCIPAL ARTERIALS

Rural principal arterials are sub-divided into two sets (1) interstate facilities and (2) other principal arterials. They consist of a connected rural network of continuous routes and provide an integrated network without stub connections.

### RURAL MINOR ARTERIALS

In conjunction with the principal arterials, the rural minor arterials form a rural network which link cities and larger towns together with other major traffic generators. The principal arterials and rural minor arterials are spaced at such intervals that all developed areas of the state are within a reasonable distance of an arterial highway. Minor arterials should be expected to provide for relatively high overall travel speeds with minimum interference to through movement.

The other rural road classifications are:

**Rural Major Collector Roads** (are eligible for federal funding)

**Rural Minor Collector Roads** (are not eligible for federal funding) and

**Rural Local Roads**

### NATIONAL HIGHWAY SYSTEM (NHS)

ISTEA also required that roads be designated as National Highway System (NHS) facilities. Congress approved the NHS system with passage of the National Highway System Designation Act of 1995 (NHS Act). In Clark County the following roads have been designated as NHS facilities:

**Table 3-1: Designated NHS Facilities; Clark County**

DESIGNATED NHS FACILITIES - Clark County	
Facility	Extent
I-5	Oregon State Line to Clark County line (north)
I-205	Oregon State Line to I-5 Interchange
SR-14	I-5 to Clark County line (east)
SR-500	I-5 to SR-503 intersection
SR-501	I-5 to Port of Vancouver access
SR-502	I-5 to SR-503 intersection
SR-503	SR-500 intersection to SR-502 intersection

**Table 3-2: Federal Functional Classification Mileage**

FEDERAL FUNCTIONAL CLASSIFICATION OF CLARK COUNTY ROADS Mileage of Classified and Local Roads					
Facility Type	Vancouver Urban Area	Camas Urban Area	Rural Remainder of County	Total Clark County	% of Total
Interstates	22.1	0.0	9.2	31.4	1.2%
Expressways & Principals	78.2	11.5	14.2	103.9	4.0%
Minor Arterials	94.5	24.1	19.7	138.3	5.3%
Urban Collectors and Rural Major Collectors	133.2	16.0	204.4	353.5	13.6%
Rural Minor Collectors	0.0	0.0	143.1	143.1	5.5%
Local Roads	625.8	71.3	1,136.3	1,833.4	70.4%
Total	953.8	123.0	1,526.9	2,603.6	100.0%

There is a state-wide limitation on the percentage of roads which can be functionally classified as Principal Arterial per federal guidelines. As a result, Clark County was unable to classify the facilities listed in Table 3-3 according to their plans for design standards for the facilities. The County intends that the listed facilities be developed to the GMA classification system design standards and, at the earliest opportunity, should be re-classified under the federal functional classification system so that both GMA and federal systems match. As the mileage of local roads increases, then the mileage of principal arterials or minor arterials could potentially be increased.

### HIGHWAYS OF STATEWIDE SIGNIFICANCE (HSS)

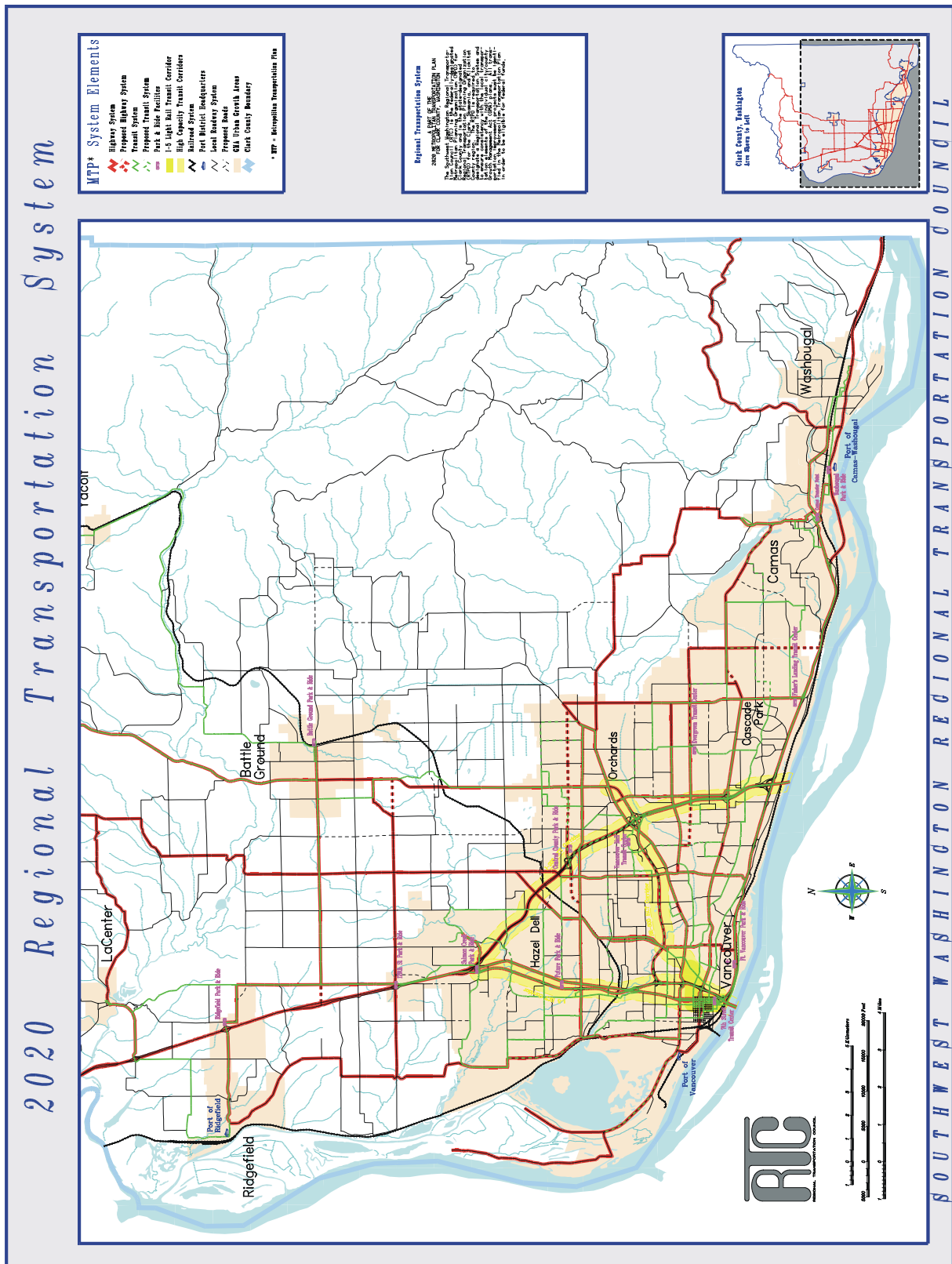
The 1999 state legislature adopted the Highways of statewide significance, fulfilling a requirements of House Bill 1487 passed in 1998. In Clark County highway facilities defined as of Statewide Significance are I-5, I-205, SR-14 and part of SR-501 to access the Port of Vancouver.

**Table 3-3: Clark County Functional Re-classification**

<b>Clark County Facilities for Functional Re-classification</b>			
<b>Facility</b>	<b>Extent</b>	<b>Federal Functional Classification</b>	<b>GMA Functional Classification</b>
St. John's	NE 78 <sup>th</sup> St to NE 72 <sup>nd</sup> Ave	Minor Arterial	Principal
Andresen/NE 72 <sup>nd</sup> Ave	NE 78 <sup>th</sup> St to NE 119 <sup>th</sup> St	Minor Arterial	Principal
NE 18 <sup>th</sup> St (part proposed, part existing)	Andresen to NE 162 <sup>nd</sup> Ave	Minor Arterial	Principal
SE/NE 192 <sup>nd</sup> Ave (part proposed, part existing)	SR-14 to NE 18 <sup>th</sup> St	Minor Arterial	Principal
Mill Plain (part proposed, part existing)	NE 164 <sup>th</sup> Ave to SE 1st St (180 <sup>th</sup> Ave vicinity)	Minor Arterial	Principal
Mill Plain	180 <sup>th</sup> Ave vicinity to Camas City Limits	Minor Arterial	Principal
179 <sup>th</sup> St	NW 11 <sup>th</sup> to NE 29 <sup>th</sup> Ave	Collector	Principal
Lakeshore/36 <sup>th</sup> Ave	Bliss Rd to NE 78 <sup>th</sup> St	Minor Arterial	Principal
Ward Rd	Fourth Plain to 162 <sup>nd</sup> Ave	Minor Arterial	Principal
Andresen Rd	NE 18 <sup>th</sup> St to Mill Plain	Minor Arterial	Principal



Figure 3-3: 2015 Regional Transportation System



## DESIGNATION OF THE RTP REGIONAL TRANSPORTATION SYSTEM

Consistent with the state's Regional Transportation Planning Program Planning Standards, the designated MTP regional transportation system (see Figure 3-3) includes:

1. All state transportation facilities and services (including highways, state-owned park-and-ride lots etc.)
2. All local freeways, expressways, and principal arterials (the definition of principal arterials can be the same as used for federal classification or be regionally determined).
3. All high-capacity transit systems (any express-oriented transit service operating on an exclusive right-of-way including high occupancy vehicle (HOV) lanes).
4. All other transportation facilities and services, including airports, transit services and facilities, roadways, rail facilities, marine transportation facilities etc. that the RTPO considers necessary to complete the regional plan.
5. Any transportation facility or service that regional need or impact places in the plan, as determined by the RTPO.

It is the designated regional transportation system which is the focus for transportation planning in the MTP.

A detailed description of the designated MTP Regional Transportation System follows:

1. **All state transportation facilities and services** (including state highways, state owned park and ride lots etc.)

In Clark County this category includes Interstate facilities I-5 and I-205.

Clark County has a 20.78 mile section of **I-5**, the major interstate freeway serving the west coast of the U.S.A.. I-5 provides for north-south travel and is used for interstate travel from southern California, through the state of Oregon northward through Washington State to the Canadian border. I-5 crosses the Columbia River from Oregon to Washington over the Interstate Bridge. I-5 has three lanes in each direction from the Interstate Bridge north to the Highway 99 off-ramp. There are currently two travel lanes in each direction from I-5/Highway 99 to the point at which I-205 joins I-5. North of the I-5/I-205 interchange there are again three travel lanes in each direction.

A 10.07 mile stretch of **I-205** traverses Clark County until it joins I-5 just north of N.E. 134<sup>th</sup> Street. I-205 was constructed as an alternative route to I-5, as a by-pass facility through the Portland/Vancouver metropolitan area. I-205 crosses the Columbia River over the Glenn Jackson Bridge which was opened in 1982. The Glenn Jackson Bridge has four travel lanes in each direction. North of the bridge the facility has three lanes in each direction to a point just north of the interchange with SR-500. I-205 continues as a two lane in each direction facility until it joins I-5.

State routes in Clark County include SR-14., SR-500, SR-501, SR-502 and SR-503. Following the adoption of the Road Jurisdiction Committee's criteria guiding the designation, addition or deletion of state routes it was recommended and legislated that SR-140 be returned to local jurisdictions.

**SR-14** provides the main east-west access from south-west Washington state to south-east Washington State along the north bank of the Columbia River. The facility extends 21.77 miles through Clark County to the Skamania County line with two lanes in each direction up to mile post 12 and one lane in each direction thereafter.

**SR-500** is a 20.37 mile facility entirely within Clark County and allows for east-west cross-county travel. From the interchange with I-5 the facility has two-lanes in each direction until it reaches Ward Road. The facility then becomes a one-lane in each direction facility and traverses rural Clark County until the Camas urban area is reached. SR-500 meets SR-14 in Camas. The facility carries traffic to and from the Clark County regional shopping mall, Vancouver Mall. The segment of SR-500 between I-5 and I-205 was opened as a limited access facility in 1984.

**SR-501** is comprised of two unconnected segments. The south segment extends, as a four-lane facility, from the interchange with I-5 westward along Fourth Plain. This segment of SR-501 carries traffic to and from the Port of Vancouver. The facility reduces to two lanes and branches into two in the Vancouver Lake lowlands area with both branches terminating in the lowlands. The northern segment extends as a two-lane facility from I-5 westward to the City of Ridgefield where it terminates. Originally it was intended that the two segments be joined to complete a circumferential route around the westside of the Vancouver urban area and to carry traffic to and from the lowlands industrial area. However, the facility was never completed.

**SR-502** extends from the I-5/N.E. 179<sup>th</sup> Street interchange northward to N.E. 219<sup>th</sup> Street where it turns eastbound toward Battle Ground.

**SR-503** extends northward from its intersection with SR-500 to the Cowlitz County line. The route has four lanes to N.E. 144<sup>th</sup> Street at which point it reduces to two lanes.

**Table 3-4: State Route Mileage in Clark County**

STATE ROUTE MILEAGE IN CLARK COUNTY					
Facility	Beginning Mile Post	Begins at: (Description)	Ending Mile Post	Ends at: (Description)	Route Mileage
I-5	0	Oregon State Line on Interstate Bridge	20.78	Cowlitz Co. Line	20.78
I-205	0	Oregon State Line on Glenn Jackson Bridge	10.07	Interchange with SR-5	10.07
SR-14	0	Interchange with SR-5, Vancouver	21.77	Skamania Co. Line	21.77
SR-500	0	Interchange with SR-5	20.37	Intersection with SR-14, Camas	20.37
SR-501 S. Section	0	Interchange with SR-5	12.72	Terminus of south segment	19.88
SR-501 N. Section	16.91	City of Ridgefield	19.88	Interchange with I-5/ N.E. 269 <sup>th</sup> St.	
SR-502	0	Intersection with SR-5, at N.E. 179 <sup>th</sup> St.	7.56	Intersection with SR-503	7.56
SR-503	0	Intersection with SR-500	19.73	Cowlitz Co. line	19.73

**2. All local freeways, expressways, and principal arterials**

Local expressways and principal arterials are also designated as part of the regional transportation system. Principal arterials, such as Mill Plain, Fourth Plain, N.E. 78<sup>th</sup> Street, N.E. 112<sup>th</sup> Avenue, SE/NE164th/162<sup>nd</sup> Avenue. and segments of St. John's and Andresen are included. Future planned arterials on the regional system are marked on Figure 3-3 by a dashed red line. Future planned facilities include the Padden Expressway, the Mill Plain Extension, 192<sup>nd</sup> Avenue (from SR-14 north) and NE 18<sup>th</sup> Street extension west from NE 102<sup>nd</sup> Avenue to NE 87<sup>th</sup> Avenue.

**3. All high-capacity transit systems** (any express-oriented transit service operating on an exclusive right-of-way including high occupancy vehicle (HOV) lanes).

The I-5 (from State line to the vicinity of NE 134<sup>th</sup> Street), I-205 (from state line to vicinity of NE 134<sup>th</sup> Street) and SR-500 (from I-5 to the Orchards area) corridors are designated as High Capacity Transit (HCT) corridors. Planning for Light Rail Transit (LRT) in the I-5 corridor, terminating in the vicinity of Clark College, is underway.

**4. All other transportation facilities and services considered necessary to complete the regional transportation plan.** These include transit services and facilities, roadways, rail facilities, airports, marine transportation facilities etc.

Clark County is served by the C-TRAN transit system which operates a **FIXED ROUTE BUS SYSTEM** on urban and rural routes in Clark County and express bus service for commuters to Portland, Oregon. Figure 3-3 marks C-TRAN's existing fixed route system and also marks potential extension of the system with green dashed lines. Table 3-5 describes the existing fixed-route bus system.

**Table 3-5: C-TRAN Fixed Route System (July 2000)**

C-TRAN FIXED SYSTEM - BUS ROUTES (July 2000)							
Bus Route Number	Route Name	Weekday Service First Run Begins	Weekday Service Last Run Begins	Weekday Service Frequency	Saturday Service	Sunday/Holiday Service	Area Served (TC = Transit Center; P&R = Park and Ride)
1	Fruit Valley	6:05 a.m.	8:57 p.m.	30 mins.	Yes	Yes	7 <sup>th</sup> St TC to west side Vancouver
2	Lincoln/Felida	6:15 a.m.	8:45 p.m.	30-60 mins.	Yes	Yes	7 <sup>th</sup> St TC to Salmon Creek Park & Ride
3	City Center	5:45 a.m.	9:00 p.m.	30 mins. 30 mins.	Yes	Yes	A Loop: Kauffman to Columbia B Loop: Columbia to Kauffman
4	Fourth Plain	5:45 a.m.	9:15 p.m.	15 mins.	Yes	Yes	7 <sup>th</sup> St TC to Vancouver Mall, via 4 <sup>th</sup> Plain
6	Hazel Dell	5:45 a.m.	8:45 p.m.	30 mins.	Yes	Yes	7 <sup>th</sup> St. TC to Salmon Creek Park & Ride on west side of I-5
7	Battle Ground	5:45 a.m.	8:45 p.m.	45 mins.	Yes	Yes	Van Mall TC to Battle Ground
25	St John's	5:45 a.m.	8:45 p.m.	30 mins..	Yes	Yes	7 <sup>th</sup> St. TC to Minnehaha area via St. John's and Hazel Dell
30	Burton	5:45 a.m.	8:45 p.m.	30 mins.	Yes	Yes	7 <sup>th</sup> St TC to Fisher's Landing TC via Burton Rd and 162 <sup>nd</sup> Av
32	Evergreen/Andresen	5:45 a.m.	8:45 p.m.	30 mins.	Yes	Yes	7 <sup>th</sup> St TC to Van Mall, via Evergreen Blvd and Andresen
37	Mill Plain	5:30 a.m.	9:15 p.m.	15 mins.	Yes	Yes	7 <sup>th</sup> St TC to Fisher's Landing TC via Mill Plain Blvd
39	Clark College/Medical Center	7:15 a.m.	8:40 p.m.	60 mins.	Yes	Yes	7 <sup>th</sup> St TC to SW Washington Medical Center
71	Highway 99	5:15 a.m.	9:15 p.m.	15 mins.	Yes	Yes	7 <sup>th</sup> St. TC to Salmon Creek Park & Ride
72	Orchards	6:45 a.m.	9:05 p.m.	30 mins.	Yes	Yes	Vancouver Mall TC to Orchards/Five Corners
76	NE 76 <sup>th</sup> /Sifton	5:30 a.m.	8:25 p.m.	30 mins.	Yes	Yes	Vancouver Mall to NE 99 <sup>th</sup> St and NE 152 <sup>nd</sup> Av
78	78 <sup>th</sup> Street	6:30 a.m.	8:50 p.m.	60 mins.	Yes	Yes	Vancouver Mall to Hazel Dell Av/99 <sup>th</sup> Street via 78 <sup>th</sup> St
80	Van Mall/Fisher's	5:30 a.m.	8:45 p.m.	30 mins.	Yes	Yes	7 <sup>th</sup> St TC to Fisher's Landing TC
92	Ca.m.as/Washougal	6:15 a.m.	8:40 p.m.	30 mins.	Yes	Yes	Fisher's Landing TC to Ca.m.as/Washougal (45 <sup>th</sup> St and Addy)

C-TRAN FIXED SYSTEM - BUS ROUTES (July 2000)							
Bus Route Number	Route Name	Weekday Service First Run Begins	Weekday Service Last Run Begins	Weekday Service Frequency	Saturday Service	Sunday/Holiday Service	Area Served (TC = Transit Center; P&R = Park and Ride)
93	SE 34 <sup>th</sup> /Laca.m.as	6:45 a.m.	8:15 p.m.	60 mins.	No	No	Fisher's Landing TC to NE 3 <sup>rd</sup> Av and Dallas (Ca.m.as)
105	I-5 Express	5:21 a.m.	6:34 p.m.	5-60 mins.	No	No	7 <sup>th</sup> St TC to Downtown Portland (14 <sup>th</sup> and Glisan)
114	Ca.m.as/Washougal Limited	6:30 a.m.	5:15 p.m.	1, a.m. trip 1, pm trip	No	No	Washougal/Ca.m.as via Fisher's Landing TC and 7 <sup>th</sup> St TC to Downtown Portland (SW 6 <sup>th</sup> and Salmon)
134	Salmon Creek Express	5:15 a.m.	7:00 p.m.	Peak 5-30 mins.	No	No	Salmon Creek P&R to Downtown Portland (14 <sup>th</sup> and Glisan)
135	Ridgefield Express	6:30 a.m.	6:05 p.m.	1, a.m. trip 1, p.m. trip	No	No	NW 269 <sup>th</sup> St and NW 11 <sup>th</sup> Av (Ridgefield) to Salmon Creek Park & Ride
156	BPA/Lloyd Center Express	6:05 a.m.	5:12 p.m.	Peak 60 mins.	No	No	BPA Park & Ride to MLK & Multnomah via downtown Portland
164	Fisher's Landing Express	6:00 a.m.	7:00 p.m.	Peak 7-45 mins.	No	No	Fisher's Landing TC to SW 5 <sup>th</sup> & Hall (Portland)
165	Gateway Express	6:15 a.m.	7:15 p.m.	15-60 mins.	No	No	Fisher's Landing TC to Gateway TC
173	Battle Ground Limited	6:35 a.m.	6:15 p.m.	1, a.m. trip 1, pm trip	No	No	Battle Ground Park & Ride to Salmon Creek Park & Ride
177	Evergreen Express	5:20 a.m.	6:35 p.m.	Peak 30-45mins.	No	No	Evergreen Park & Ride to Downtown Portland (SW 5 <sup>th</sup> and Hall)
190	Marqua.m. Hill Express	6:00 a.m.	4:45 p.m.	Peak 60 mins.	No	No	Van Mall to Marquam. Hill
191	Swan Island Express	6:00 a.m.	5:00 p.m.	Peak 60 mins.	No	No	Van Mall TC to Swan Island (Anchor and Channel)

During normal C-TRAN service hours, a connection is provided between the Vancouver Amtrak Station and the 7<sup>th</sup> Street Transit Center through a taxi voucher program. All of C-TRAN Clark County local routes use lift-equipped buses making them accessible to people with disabilities. C-TRAN also operates a paratransit service, C-VAN. C-TRAN's paratransit service plan is described in the publication *1997 C-TRAN ADA Paratransit Service Plan* (January, 1997). C-TRAN attained full compliance with the ADA in January of 1997. All of C-TRAN's buses are also equipped with bicycle racks. C-TRAN runs a training program to prepare bicyclists for use on transit.

All of C-TRAN's fixed route system and facilities are included as part of the designated regional transportation system.

**Table 3-6: C-TRAN; Paratransit Service**

<b>C-TRAN PARATRANSIT SERVICE (C-VAN)</b>		
<b>Year</b>	<b>Paratransit Trips</b>	<b>Revenue Hours Per Year</b>
1994	99,036	32,212
1995	115,841	41,803
1996	142,495	48,317
1997	170,816	56,728
1998	186,665	67,769
1999	188,367	65,822

C-TRAN's facilities include transit centers and park-and-ride lots described in Table 3-7, below. C-TRAN uses security measures to make the transit system safe for its users. These security measures include provision of security patrols at the Seventh Street Transit Center in Downtown Vancouver, Fisher's Landing Transit Center and Vancouver Mall Transit Center. The City of Vancouver's Police Department bike patrol regularly patrols the 7<sup>th</sup> Street Transit Center. C-TRAN has contracted with the City of Vancouver to ensure that the bike patrol monitors the 7<sup>th</sup> Street Transit Center. C-TRAN buses are equipped with emergency alarms and two-way radios. Additionally, randomly placed surveillance cameras are located on various buses. Customer service facilities are located at the 7<sup>th</sup> Street, Fisher's Landing and Vancouver Mall Transit Centers, and public restrooms are located at 7<sup>th</sup> Street, and Fisher's Landing. Passenger shelter, bench, and waiting facilities are provided at most of the park and ride lots. Bicycle locker or rack facilities are provided at some of the lots.

**Table 3-7: C-TRAN; Transit Centers and Park and Ride Facilities (July 2000)**

<b>C-TRAN TIME TRANSFER CENTERS AND PARK AND RIDE FACILITIES (JULY 2000)</b>			
<b>FACILITY</b>	<b>TRANSIT CENTER/ PARK-AND-RIDE</b>	<b>PARKING SPACES</b>	<b>BUS ROUTES</b>
Downtown Vancouver, 7 <sup>th</sup> Street Transit Center	Transit Center	N/A	1, 2, 3, 4, Tri-Met 5, 6, 25, 30, 32, 37, 39, 71, 105, 114
Vancouver Mall	Transit Center	N/A	4, 7, 32, 72, 76, 78, 80, 190, 191
Fisher's Landing	Transit Center and Park- and-Ride	560	30, 37, 80, 92, 93, 114, 164, 165,
Evergreen Transit Center	Park-and-Ride	279	177
Salmon Creek	Park-and-Ride	436	2, 6, 71, 134, 135, 173
BPA Ross Complex	Park-and-Ride	200+	156, 190, 191
Vancouver Mall (Regal Cinemas)	Park-and-Ride	60+	4, 7, 32, 72, 76, 78, 80, 190, 191
Battle Ground	Park-and-Ride	28	7, 173
Camas/Washougal	Camas Transfer Center Washougal Park-and-Ride	20	92, 93, 114 92,114
Ridgefield	Park-and-Ride	42	135

Greyhound provides **INTER-CITY BUS** service in the I-5 corridor from its bus depot in Downtown Vancouver.

Clark County has three **PORT DISTRICTS**; the Port of Vancouver, the Port of Camas-Washougal and the Port of Ridgefield.

The **Port of Vancouver** operates an international cargo dock used by over 440 ships, carrying over 5.6 million metric tons of cargo, a large percentage of which was grain, in 1995. The Port is expanding its dry bulk handling facilities. The Port also has industrial property with around forty tenants and holds property in the Vancouver Lake Lowlands for future development of recreational facilities, a business park, industrial sites and expansion of its marine terminal operations.

The **Port of Ridgefield's** taxing district extends over 110 square miles of land. Port-owned assets include a 78-acre industrial park, located near the I-5/269<sup>th</sup> interchange and N.W. Timm Road. The Port's land adjacent to the Ridgefield Junction is zoned for light industrial use and is currently home to several businesses. The Port also holds 4,615 acres of the Ridgefield Wildlife Refuge, parcels of land within the Ridgefield city limits totaling less than 5 acres and has 5 acres of industrial-zoned land on the Lake River waterfront.

The **Port of Camas/Washougal's** taxing district extends over 95 square miles of land with an industrial park, marina, airport, a park and wildlife refuge. The 430-acre industrial park, located south of SR-14 by Index and 27<sup>th</sup> to 32nd Streets, has 25 industries each employing between 1 and 164 people. The marina has moorage to accommodate 330 plus 25 additional spaces for guests, a restaurant, two yacht clubs and a boat launch. The Port district also operates Grove Field Airport (described in a later section).

There are two main **RAIL LINES** in use in the County which provide freight and passenger service. Both main lines are owned by Burlington Northern/Santa Fe (BNSF). In addition, a privately owned rail line in the county also offers freight and tourist train passenger service.

The BNSF Seattle/Vancouver line is in excellent condition and has 70 to 80 trains operating in the corridor each day. The Vancouver/Eastern Washington line is also in excellent condition and handles about 35 trains daily. Union Pacific Railroad operates some freight trains to Tacoma and Seattle on BNSF's lines. The Rye Branch is a short segment which diverges from the main northern line around NW 78<sup>th</sup> Street to Rye yard off St. John's Road. The track is in fair condition; freight trains use it about twice weekly. AMTRAK has an agreement with BNSF to operate passenger service on the freight carrier's rail lines. AMTRAK trains serve Vancouver daily. During the 1990's Washington and Oregon began to invest transportation funds to improve local AMTRAK service. In 1993, Amtrak offered a single local daily round-trip connecting Eugene and Seattle with ridership totaling 94,061 trips. In 2000, three daily Amtrak Cascades roundtrips serve Seattle and Portland, with two extending to Eugene. One daily roundtrip serves Seattle and Vancouver, BC and one daily roundtrip serves Seattle and Bellingham, with guaranteed motorcoach connections to Vancouver, BC. Between 1993 and 2000, ridership has increased five times, with 2000 ridership levels for the Amtrak Cascades service at 525,000 trips. This is a 16% increase compared with 1999 ridership of 449,974 trips.



The *Coast Starlight*, with service between Seattle and Los Angeles via Vancouver and Portland, also serves the corridor. The *Empire Builder* travels between Chicago and Spokane with one part of the train continuing on to Seattle and the other part continuing on, via Pasco and Bingen-White Salmon, to Vancouver with service terminating in Portland.

The Pacific Northwest Rail Corridor is one of only five designated high-speed corridors in the nation which pre-qualifies the region for federal high-speed rail funding. In late 1995, the Washington State Department of Transportation (WSDOT) and project partners published *Options for Passenger Rail in the Pacific Northwest Rail Corridor* report. An Environmental Impact Statement on corridor improvements was completed and construction on some rail system improvements began in 1998. Custom-built Talgo trains are now in service on Amtrak's Pacific Northwest Rail Corridor service. Plans are underway to upgrade the Vancouver Amtrak station facility and site as part of the Eugene to Vancouver B.C. passenger rail service improvements in preparation for high speed rail service in the corridor.

The Lewis & Clark Railway line is county-owned but leased to a private operator. The 30 mile line extends from the Rye yard to Chelatchie Prairie. Freight cargo deliveries of plasterboard, plastics, chemicals and machinery can be made to local industries.

Commuter Rail has been considered as an option for travel within the region. The Commuter Rail Study considered the options and reported on future capacity of the rail corridors in the region. For a description of the Study please see Chapter 5, Commuter Rail/Rail Capacity Issues section.

For **AIR TRANSPORTATION**, Clark County largely relies on the Portland International Airport (PIA) located in Portland, Oregon to the south-west of the I-205 Glenn Jackson Bridge. This is a regional airport with domestic and international passenger and freight service. Passenger airlines currently serving PIA include Air BC, Alaska Airlines, America West, American Airlines, Continental, Delta, Delta Connection, Frontier, Hawaiian, Horizon, Northwest, Skywest, Southwest, TWA, United, and United Express. PIA has seen rapid growth in passenger numbers and freight in recent years and now consistently serves over 1 million passengers per month. In 1998, passenger numbers surpassed 13 million for the first time. In 1999 passenger numbers totaled 13.7 million. 1999 cargo was 274,971 tons. August 1999 passengers served by PDX exceeded 1.39 million, beating all previous monthly records. The airport is served by Tri-Met public passenger bus service from Portland.

Within Clark County, the following general aviation airfields are in operation: (1) Pearson Field, located 2 miles south west of Downtown Vancouver off SR-14, is operated by the City of Vancouver and covers 134 acres owned by the U.S. Park Service. The Airpark has one paved runway (3,200 feet by 60 feet) and can accommodate 177 aircraft. The Airpark is on the Washington State Historical Register. Pearson is designated as a part of the regional transportation system. 2) Evergreen Airport is located six miles east of Vancouver, off Mill Plain. It is a privately-owned, 102-acre airfield with one asphalt and two turf runways, 99 hangars and 170 tie-downs providing a base for 250 planes. (3) Grove Field, located 3 miles north of the City of Camas, is operated by the Port of Camas\Washougal. It has one turf runway, 31 hangars and can accommodate 42 aircraft on its 42 acre site. Estimates of aircraft operations

at the three airfields are provided in Table 3-8. In addition, there are a number of private airfields located in Clark County which include those described below. Taylor's Green Mountain Airpark is a 23-acre facility, located 9 miles east of downtown Vancouver with one paved runway, six hangars and ten-tie downs. Eight aircraft are based at the Airpark. Goheen Airport, located three miles northwest of Battle Ground, is privately owned. It has one turf runway and provides a base for about 18 planes. 45 acres of Goheen's 60 acre area are zoned for airport use.

The Washington State Department of Transportation's Aeronautics Division and the local pilots' association have proposed that an additional airport should be sited in Clark County because of the vulnerability of existing airfields in the County due to ownership issues and development pressures. Efforts in the 1980's to site such a facility were thwarted when neighborhood residents opposed a proposed airport location in the vicinity of the I-5/Ridgefield Junction. Federal and state agencies and local jurisdictions have to work together to site such facilities and local jurisdictions must ensure that the land uses surrounding the facility are compatible with aircraft operations and remain that way.

**Table 3-8: Aircraft Operations Estimates**

AIRCRAFT OPERATIONS ESTIMATES 1998 from Washington State Continuous Airport System Plan (WSDOT/Aeronautics)								
Airport Name All are Private	Based Aircraft:		General Aviation Local	General Aviation Itinerant	Air Carrier	Air Taxi	Commuter	Military
	Single Engine	Multi- Engine						
Evergreen Field (Vancouver)	240	5	170,000	30,000			0	50
Fly for Fun (Clark County)	9		500	2,500	0	0	0	0
Goheen (Battle Ground)	35		1,350	270	0	0	0	0
Grove Field (Camas)	60	1	5,600	7,000			0	0
Pearson Field (Vancouver)	210	10	23,228	84,201		3,471	0	1,100

**Notes:**

(1) No regional airlines or major national airlines serve Clark County airports/airfields

**Source:** FAA 5010 Forms; Airport Management Records; Washington State Aeronautics Division Records

## REGIONAL TRANSPORTATION SYSTEM PERFORMANCE

### GROWTH IN TRAFFIC VOLUMES

As a result of socio-economic and demographic changes described in Chapter 2 Clark County has seen significant growth in traffic volumes in recent years. The MPO compiles traffic count data from local jurisdictions and periodically publishes data in the *Regional Traffic Count*

*Manual.* Traffic count data is factored to adjust for seasonal, monthly, weekly and daily fluctuations in volumes. Examples of growth in traffic volumes at selected Clark County locations are listed in Table 3-9 below.

Permanent traffic recorders are in place on the I-5 and on the I-205 bridges. RTC compiles the traffic counts provided by Oregon Department of Transportation from these recorders. In March, 1995 RTC published the *Columbia River Bridge Traffic, 1961 - 1994* report. This data is now updated annually and is available on RTC's web site (<http://www.rtc.wa.gov/tc/brdgawd.htm>). Figure 3-4 shows the average weekday traffic volumes crossing the Columbia river bridges, 1978 to 1998. The most recent traffic counts available for the two bridges are for September 2000. In September 2000 the average daily traffic for the month on the I-5 Interstate Bridge was 121,984 [ADT] (126,257 average weekday traffic [AWD]). On the I-205 Glenn Jackson Bridge, the average weekday daily traffic for the month of September 2000 was 129,000 [ADT] (124,800 average weekday traffic [AWD]). In September 2000, the maximum northbound weekday evening peak hour crossings on the I-5 Interstate Bridge were 5,575 and 7,685 on the I-205 Glenn Jackson Bridge. In the southbound direction, maximum weekday morning peak hour crossings were 5,893 on the I-5 Interstate Bridge and 7,653 on the I-205 Glenn Jackson Bridge.

**Table 3-9: Traffic Volumes; 1985, 1999**

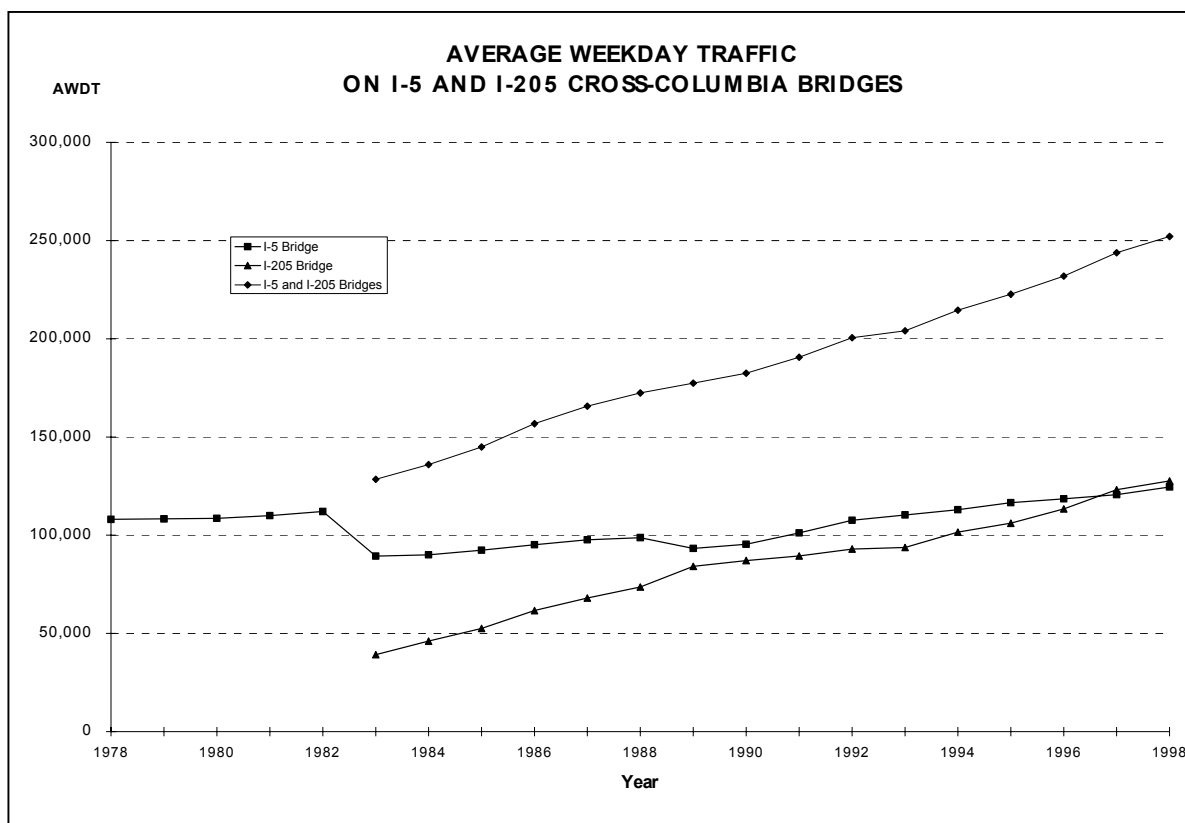
TRAFFIC VOLUMES - ALL DAY (ADT)				
Location	1985 Volumes	1999 Volumes	% Increase	Annual % Increase
I-5 Bridge	92,301	126,589	37	2.7
I-205 Bridge	52,568	130,761	149	10.6
I-5, South of NE 78 <sup>th</sup> St	52,784	96,551	83	5.9
I-205, South of SR-500	40,440	104,140	158	11.3
SR-14, West of SE 164 <sup>th</sup> Ave	22,600	70,680	213	15.2
Mill Plain, east of NE Andresen	21,021	26,405	26	1.8
Mill Plain, east of NE Chkalov	18,220	44,101	142	10.1
Fourth Plain, West of NE Andresen	16,060	26,180	63	4.5
SR-500, West of NE Andresen	20,054	47,886	139	9.9
SR-503, South of NE 76 <sup>th</sup> St	17,460	38,140	118	8.5
78 <sup>th</sup> St, West of Hwy 99	23,646	30,815	30	2.2
Hwy 99, South of NE 99 <sup>th</sup> St	19,653	19,178	-2	-0.2

The highest daily traffic ever recorded on the I-5 Interstate Bridge was on Friday June 18, 1999 when 149,847 bridge crossings were made. The highest evening peak hour traffic ever recorded on the I-5 Bridge was on Tuesday May 28, 1996 when 10,838 bridge crossing were made; of these 5,520 were northbound and 5,318 were southbound. For the northbound direction, the highest evening peak hour traffic was recorded on Thursday June 11, 1998 when 5,987 bridge crossings were made. For the southbound direction, the highest morning peak hour traffic was recorded on Wednesday May 10, 1995 when 6,069 bridge crossings were made.

The I-205 Glenn Jackson Bridge's highest daily crossings ever recorded was on Friday September 19, 1997 with 158,982 crossings. This was during the I-5 Bridge repair project which closed the northbound span of the I-5 Bridge. The highest evening peak hour traffic recorded on the I-205 Glenn Jackson Bridge was on Friday May 24, 1996 (Memorial Day weekend) when 12,800 bridge crossings were made. Of these bridge crossings, 8,426 were northbound and 4,374 were southbound. The highest northbound evening peak hour traffic recorded on the Bridge is the 8,426 crossings made on Wednesday Friday May 24, 1996. For the southbound direction, the highest morning peak hour traffic was recorded on Tuesday October 27, 1998 when 8,020 bridge crossings were made.

**Figure 3-4: I-5, I-205 Average Weekday Bridge Crossings**

Regional transportation system intersections with the highest traffic volumes, measured in terms of number of vehicles entering intersection are listed in Table 3-10.



**Table 3-10: Highest Volume Intersections in Clark County, 2000**

CLARK COUNTY HIGHEST VOLUME INTERSECTIONS - 2000				
Rank	East-West	North/South	Approx. Volume	Count Year
1	State Route 500	Gher Rd/NE 112 <sup>th</sup> Avenue	87,000	1999
2	State Route 500	Thurston Way	85,000	1998
3	Mill Plain Blvd.	Chkalov Drive	80,000	2000

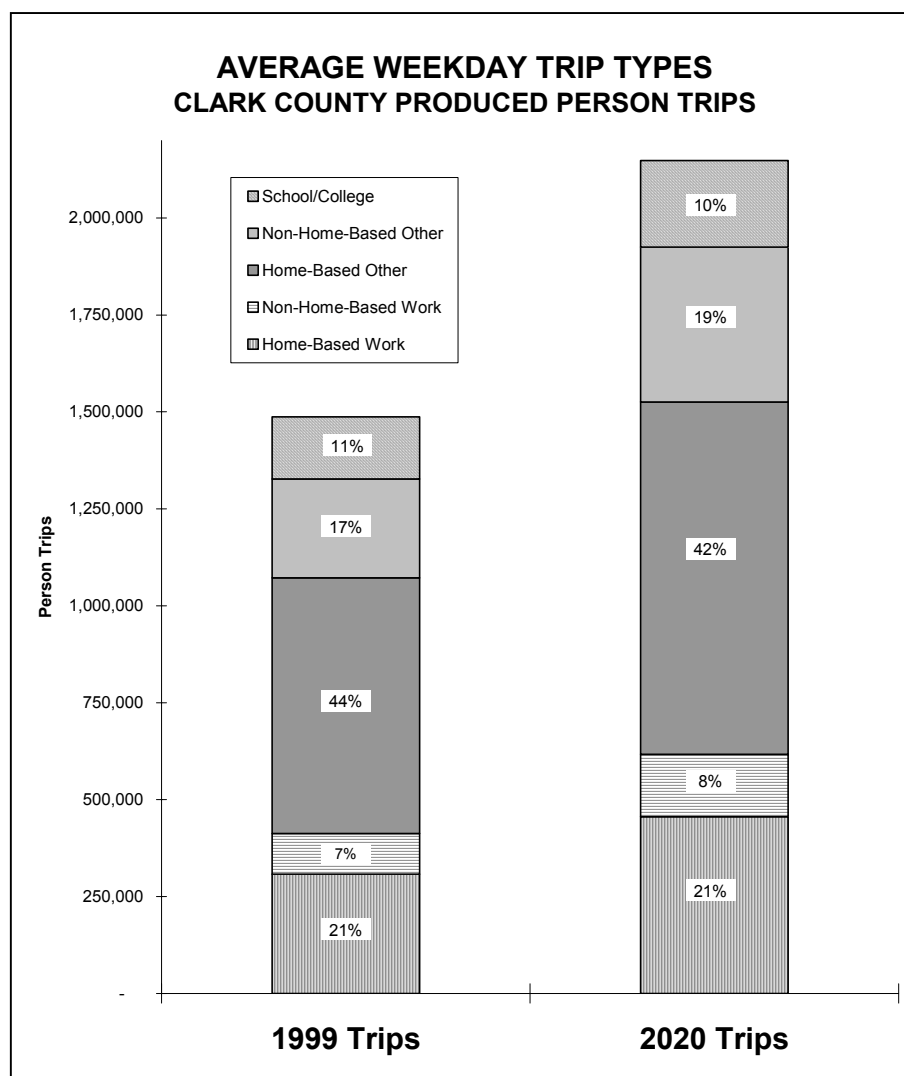
4	State Route 500	State Route 503	70,000	1999
5	State Route 500	St. John's Road	66,000	2000
6	State Route 500	NE 54 <sup>th</sup> Avenue	58,000	1999
7	State Route 500	NE 42 <sup>nd</sup> Avenue	56,000	1999
8	Fourth Plain Blvd.	Andresen Road	55,000	2000
9	NE 76 <sup>th</sup> Street	State Route 503	53,000	1999
10	Mill Plain Blvd.	NE 123 <sup>rd</sup> /124 <sup>th</sup> Avenue	52,000	1998
11	NE 78 <sup>th</sup> Street	Highway 99	49,000	1999
12	Mill Plain Blvd.	136 <sup>th</sup> Avenue	49,000	1998
13	SE 34 <sup>th</sup> Street	SE 164 <sup>th</sup> Avenue	47,000	1999
14	Mill Plain Blvd.	Andresen Road	44,000	1998
=15	Padden Parkway	State Route 503	43,000	1999
=15	Fourth Plain (SR-500)	NE 121 <sup>st</sup> Avenue	43,000	2000
<p><b>Notes:</b> Volumes are based on the total number of vehicles entering an intersection on an average weekday, and are approximate due to the variability from year to year. Freeway ramp intersections with streets were not considered for this listing <b>Source:</b> RTC's Regional Traffic Count Program.</p>				

## REGIONAL TRAVEL FORECASTING MODEL: FORECASTING FUTURE TRAVEL DEMAND AND TRANSPORTATION NEEDS

The Regional Travel Forecasting Model for the Clark County region was used to forecast future traffic volumes on the regional transportation system. EMME/2 software is used for the Clark County region's travel forecasting model. In the modeling process, a base year of 1999 was used and a forecast to the year 2020 was made. Growth allocations for future population, housing and employment (as described in Chapter 2) and existing local comprehensive land use plans and zoning were used as a basis for forecasting future population and employment distributions within Clark County. The regional model uses demographic data as a basis for travel forecasts and the data is run through trip generation, trip distribution, mode split and trip assignment processes. Alternative land use scenarios were tested, and their effect on regional transportation needs measured, as a part of the Growth Management planning process. This regional travel forecasting model for the MTP is based on GMA plans.

Trips can be classified according to place of trip production and purpose of trip. The regional travel forecasting model for Clark County categorizes trips into six groups, they are Home-Based Work, Non-Home-Based Work, Home-Based Other, Non-Home-Based Other, School and College trips. Figure 3-5 show the proportion of trips in each of these categories for average weekday Clark County-produced person trips. In Figure 3-5 College and School trips have been aggregated.

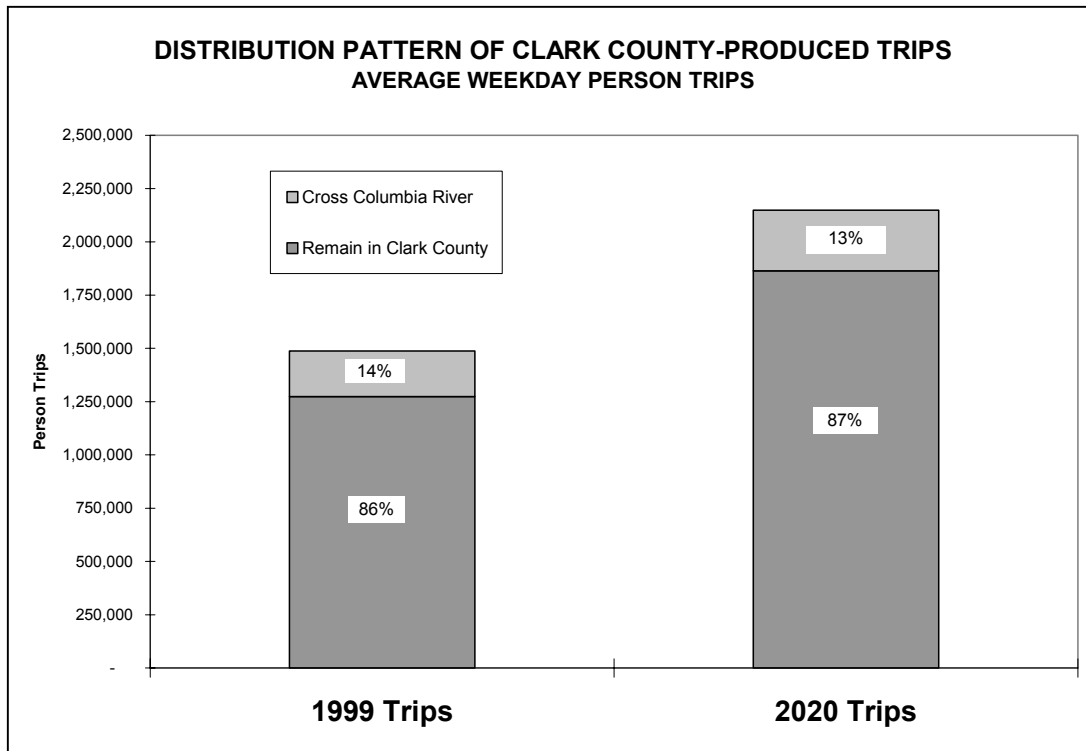
Figure 3-5 shows that in the 1999 base year the largest proportion of trips during a 24-hour period are Home-Based-Other trips (44%). This category can include trips from home to the grocery store, home to childcare, home to leisure activities etc. The second highest category is Home-Based Work trips (21%). Non-Home Based Other trips make up 17% of the trips. This category can include such trips as shopping mall to restaurant trips. The home-based categories include trips originating at home and going to a destination as well as the return trip to home. The proportions for the year 2020 are 42% Home-Based-Other trips, 21% Home-Based-Work trips and 19% Non-Home Based Other. From 1999 to 2020 there is forecast to be a 44% increase in all-day person trips from around 1,487,000 trips per day in 1999 to over 2.1 million in 2020.



**Figure 3-5: Average Weekday Trip Types, Clark County Produced Person Trips**

Trips can also be categorized according to where the trips begin and end. Figure 3-5 shows proportions of trips which use the Clark County highway system in terms of those trips which remain in Clark County (86%) and those trips which cross the Columbia River (14%).

**Figure 3-6: Distribution Patterns of Clark County Produced Person Trips, Average Weekday**



Needs analysis was then carried out to determine what impact this forecast growth in travel demand might have on the transportation system. In carrying out analysis of existing and future transportation needs the regional travel forecasting model was used to run three scenarios:

<b>Base-Year</b>	1999 traffic volumes on 1999 highway network
<b>2017</b>	Forecast 2017 traffic volumes on 2017 MTP highway network (for comparison purposes)
<b>No-Build</b>	Forecast 2020 traffic volumes on "committed" highway network. The "committed" network has improvement projects for which funds are already committed in the Metropolitan Transportation Improvement Program (MTIP).
<b>MTP (Year 2020)</b>	Forecast 2020 traffic volumes on 2020 highway network with <i>MTP</i> improvements listed in Appendix A.  <i>MTP</i> improvements are projects for which funds are already programmed and committed in the 2001-2003 <i>Metropolitan Transportation Improvement Program</i> as well as projects for which there is an identified regional need, strong regional commitment, and a reasonable expectation that funds will be available within the twenty-year horizon to construct them.

Tables 3-11, 3-12, 3-13 and 3-14 present system-wide benchmark results from testing the scenarios described above. Each table presents data by functional classification.

**Table 3-11: P.M. Peak Hour Speed**

<b>AVERAGE PEAK HOUR SPEED ON CLARK COUNTY HIGHWAYS (Results from Regional Travel Forecasting Model, using EMME/2 software)</b>				
<b>Facility Type/Region</b>	<b>Speed in Miles per Hour</b>			
	<b>Base-Year 1999</b>	<b>2017 (for comparison)</b>	<b>No-Build (2020 demand on Committed System)</b>	<b>2020 MTP</b>
Interstates (excluding Ramps)	49	34	27	32
Interstates (including Ramps)	46	33	27	32
Expressways & Principals	35	35	29	34
Minor Arterials	33	32	28	32
Major & Minor Collectors	33	33	31	32
Other Roads	28	28	27	28
<b>Total Clark County System</b>	37	33	29	32

**Table 3-12: Peak Hour Vehicle Miles Traveled**

<b>VEHICLE MILES TRAVELED ON CLARK COUNTY HIGHWAYS IN P.M. PEAK HOUR (Results from Regional Travel Forecasting Model, using EMME/2 software)</b>				
<b>Facility Type/Region</b>	<b>Miles of Travel</b>			
	<b>Base-Year 1999</b>	<b>2017 (for comparison)</b>	<b>No-Build (2020 demand on Committed System)</b>	<b>2020 MTP</b>
Interstates (excluding Ramps)	197,900	238,067	250,909	262,920
Interstates (including Ramps)	220,110	265,373	275,277	290,469
Expressways & Principals	200,448	257,828	279,207	285,154
Minor Arterials	88,290	117,238	136,717	132,890
Major & Minor Collectors	106,580	160,997	201,380	182,354
Other Roads	12,884	20,048	23,993	23,037
<b>Total Clark County System</b>	628,312	821,484	916,574	913,904



**Table 3-13: Peak Hour Lane Miles of Congestion**

<b>LANE MILES OF CONGESTION IN P.M. PEAK HOUR</b> (Results from Regional Travel Forecasting Model, using EMME/2 software)				
<b>Facility Type/Region</b>	<b>Lane Miles of Congestion</b>			
	<b>Base-Year 1999</b>	<b>2017 (for comparison)</b>	<b>No-Build (2020 demand on Committed System)</b>	<b>2020 MTP</b>
Interstates (excluding Ramps)	8	29	49	35
Interstates (including Ramps)	12	36	55	41
Expressways & Principals	26	34	99	46
Minor Arterials	6	15	44	20
Major & Minor Collectors	7	18	45	28
Other Roads	0	2	5	3
<b>Total Clark County System</b>	<b>50</b>	<b>105</b>	<b>247</b>	<b>138</b>

Table 3-13 (above) presents data on congestion on the Clark County highway system. This measure represents the number of lane miles that operate under congested conditions (at volume to capacity ratio of 0.9 or above; equivalent to level of service E or F) during the full p.m. peak hour. The table is of most use when used to assess the relative growth in congestion which is expected to occur in the future, given the forecast increase in travel demand.

**Table 3-14: Peak Hour Vehicle Hours of Delay**

<b>P.M. PEAK HOUR VEHICLE HOURS OF DELAY - CLARK COUNTY HIGHWAYS</b> (Results from Regional Travel Forecasting Model, using EMME/2 software)				
<b>Facility Type/Region</b>	<b>Hours of Vehicle Delay</b>			
	<b>Base-Year 1999</b>	<b>2017 (for comparison)</b>	<b>No-Build (2020 demand on Committed System)</b>	<b>2020 MTP</b>
Interstates (excluding Ramps)	356	2,582	4,457	3,292
Interstates (including Ramps)	437	2,708	4,686	3,421
Expressways & Principals	300	633	2,065	913
Minor Arterials	75	121	568	205
Major & Minor Collectors	80	222	62	366
Other Roads	11	33	6	41
<b>Total Clark County System</b>	<b>904</b>	<b>3,717</b>	<b>8,013</b>	<b>4,946</b>

Table 3-14 presents vehicle hours of delay. Using the time taken to travel a highway segment at level of service C as a base condition, any road segment operating at LOS D, E or F is measured against the level of service C base condition. The time difference is calculated, aggregated for the entire highway system and the result is Vehicle Hours of Delay. The data is of use in analyzing the relative increase in delay expected to occur, given the forecast growth in travel demand.

The preceding system-wide data represents measures of assessing highway system performance, but perhaps more meaningful is an analysis of performance and needs within corridors or on individual system links and at intersecting points. A planning level of analysis, using capacity analysis and level of service standards criteria, was carried out resulting in a first-cut analysis of existing and forecast future deficiencies of the regional transportation system.

## LEVELS OF SERVICE

Level of service standards represent the minimum performance level desired for transportation facilities and services within the region. They are used as a gauge for evaluating the quality of service of the transportation system and can be described by travel times, travel speed, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. The Washington State Growth Management Act states that these standards should be established locally and standards should be regionally coordinated. The standards are used to identify deficient facilities and services in the transportation plan, and are also to be used by local governments to judge whether transportation funding is adequate to support proposed land use developments.

Levels of service are defined as "qualitative measures describing operational conditions within a traffic stream, and their perception by motorists and/or passengers". A level of service definition generally describes these conditions in terms of such factors as speed and travel time, volume conditions, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. These levels of service are designated A through F, from best to worst. Level of service E describes conditions approaching and at capacity (that is, critical density).

For uninterrupted flow conditions (such as freeways and long sections of roadways between stop signs or signalized intersections), the following definitions<sup>1</sup> apply:

- Level of Service A describes free flow conditions, with low volumes and high speeds. Freedom to select desired speeds and to maneuver with the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.
- Level of Service B is in the range of stable flow but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver with the traffic stream from LOS A.

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<sup>1</sup>..From *Highway Capacity Manual*, Transportation Research Board, 1985

- Level of Service C is still in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level.
- Level of Service D represents high-density, but stable flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.
- Level of Service E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.
- Level of Service F describes forced or breakdown flow. These conditions usually result from queues of vehicles backing up from a restriction downstream. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. It marks the point where arrival flow exceeds discharge flow.

These definitions are general and conceptual in nature, and they apply primarily to uninterrupted flow. Levels of service for interrupted flow facilities vary widely in terms of both the user's perception of service quality and the operational variables used to describe them.

## **CLARK COUNTY/VANCOUVER LOS STANDARDS**

Capacity analysis is an estimate of the maximum amount of traffic that can be accommodated by a facility while maintaining prescribed operational qualities. The definition of operational criteria is through levels of service, as described above, or by other operational criteria. The Growth Management Act requires local jurisdictions to set levels of service standards for transportation facilities. This ties in with the GMA concurrency requirement that transportation and other infrastructure is available concurrently with development. Levels of Service (LOS) standards are to be regionally coordinated. LOS standards were coordinated within the region during the GMA planning process. Clark County's initial 1994 LOS standards are outlined in Table 3-15. These have now been updated and/or repealed by actions of the Board of Clark County Commissioners and City of Vancouver as described below.

**Table 3-15: Clark County Level of Service Standards (Established in GMA Plan, 1994)**

<b>CLARK COUNTY LEVEL OF SERVICE (LOS) STANDARDS (1994)</b>	
<b>LOS B</b>	Rural arterials not identified as LOS C or below
<b>LOS C</b>	Rural connectors that link urban areas to the inter-urban routes Arterials within La Center and Yacolt that are not rural connectors of inter-urban routes All Vancouver urban area roadways not defined as LOS D and were at LOS C or above under 1994 conditions High Occupancy Vehicle (HOV) lanes <sup>1</sup>
<b>LOS D</b>	Battle Ground, Camas, Ridgefield, and Washougal urban areas Vancouver Urban Area: <ul style="list-style-type: none"> <li>• WSU and Vancouver Mall activity centers</li> <li>• Community subcenters</li> <li>• Arterials connecting community centers and subcenters</li> <li>• Arterials leading out of Vancouver Central Business District (CBD); and,</li> <li>• All other roadways maintain LOS D or maintain existing LOS, if at LOS D or below under 1994 conditions</li> </ul> Rural interurban routes (predominantly state highways)
<b>Mitigated LOS D</b>	Major multimodal transportation corridors, LOS D consistent with WSDOT service objective H-23(b), and minimum LOS E <sup>2</sup> Community centers within Vancouver urban area, with existing LOS E, provided TSM or other congestion mitigation measures are in place
<b>LOS E</b>	Downtown Vancouver Activity Center Unsignalized arterial approaches that do not meet signal warrants or a signal is not desired per an approved access management plan for the specific corridor
<b>Mitigated LOS E</b>	Columbia River bridges at or below LOS E are allowed a LOS threshold of E with a 15 percent increase in V/C ratio over existing conditions (i.e. a volume/capacity ratio range of 1.05 to 1.15 vs 0.90 to 1.00).

**Sources:** 20 Year Comprehensive Growth Management Plan for Clark County; Clark County, (1994)  
Growth Management Plan for Clark County, Transportation Element; Clark County, (1994)

1 For future High Occupancy Vehicle (HOV) lanes

2 “Mitigate congestion on urban highways in cooperation with local and regional jurisdictions when the peak period LOS falls below Level of Service D”.

Source: Washington Transportation Commission, System Plan Service Objectives, H-23(b), approved January 26, 1993

Vancouver adopted a corridor-based concurrency ordinance in March 1998. In 1999, the City of Vancouver amended the existing Level of Service (LOS) standards contained in the Mobility Management element of the Comprehensive Plan. Levels of service standards to meet Vancouver's concurrency test requirements include: 1) corridor travel times (maximum allowable travel time between two designated points along a corridor); 2) an Average Signalized Intersection Performance Standard (a quantitative standard of the performance of all signalized intersections within an identified transportation corridor or Transportation Management Zone (TMZ); and 3) Mobility Index (the maximum number or percentage of signalized intersections which may have an operating level below the Average Signalized Intersection Performance Standard. The City of Vancouver's concurrency corridors are listed below (Table 3-16):

**Table 3-16: City of Vancouver Concurrency Measurement Corridors**

<b>Andresen Rd</b>	<b>St John's Blvd.</b>
<ul style="list-style-type: none"> <li>• Mill Plain to SR-500</li> <li>• SR-500 to 78<sup>th</sup> St.</li> </ul>	<ul style="list-style-type: none"> <li>• Fourth Plain Blvd to 78<sup>th</sup> St.</li> </ul>
<b>Burton Rd</b>	<b>St James' Blvd.</b>
<ul style="list-style-type: none"> <li>• 18<sup>th</sup> St to 112<sup>th</sup> Ave</li> </ul>	<ul style="list-style-type: none"> <li>• Fourth Plain Blvd to 78<sup>th</sup> St</li> </ul>
<b>NE 28<sup>th</sup> St</b>	<b>SR-14</b>
<ul style="list-style-type: none"> <li>• 112<sup>th</sup> Ave to 138<sup>th</sup> Ave</li> <li>• 138<sup>th</sup> Ave to 162<sup>nd</sup> Ave</li> </ul>	<ul style="list-style-type: none"> <li>• I-5 to I-205</li> <li>• I-205 to 164<sup>th</sup> Ave</li> </ul>
<b>Mill Plain Blvd</b>	<b>SR-500</b>
<ul style="list-style-type: none"> <li>• I-5 to Andresen Rd.</li> <li>• Andresen Rd. to I-205</li> <li>• I-205 to 136<sup>th</sup> Ave</li> <li>• 136<sup>th</sup> Ave to 164<sup>th</sup> Ave</li> </ul>	<ul style="list-style-type: none"> <li>• I-5 to Andresen Rd.</li> <li>• Andresen Rd. to Fourth Plain Blvd.</li> </ul>
<b>164<sup>th</sup> Ave</b>	<b>NE 18<sup>th</sup> St.</b>
<ul style="list-style-type: none"> <li>• SE 1<sup>st</sup> St to SR-14</li> </ul>	<ul style="list-style-type: none"> <li>• 112<sup>th</sup> Ave to 138<sup>th</sup> Ave</li> <li>• 138<sup>th</sup> Ave to 162<sup>nd</sup> Ave</li> </ul>
<b>162<sup>nd</sup> Ave.</b>	<b>NE 112<sup>th</sup> Ave</b>
<ul style="list-style-type: none"> <li>• SE 1<sup>st</sup> St. to Fourth Plain Blvd.</li> </ul>	<ul style="list-style-type: none"> <li>• Mill Pain Blvd to 28<sup>th</sup> St</li> <li>• 28<sup>th</sup> St to SR-500</li> </ul>
<b>Fourth Plain Blvd.</b>	<b>NE 136<sup>th</sup> Ave</b>
<ul style="list-style-type: none"> <li>• Port of Vancouver to I-5</li> <li>• I-5 to Andresen Rd.</li> <li>• Andresen Rd. to I-205</li> <li>• I-205 to 117<sup>th</sup> Ave.</li> <li>• 117<sup>th</sup> Ave. to 162<sup>nd</sup> Ave</li> </ul>	<ul style="list-style-type: none"> <li>• Mill Plain Blvd to 28<sup>th</sup> St.</li> </ul>
	<b>City Center Zone (Downtown)</b>
	<b>Remaining Arterials</b>

Further information on the City's Concurrency program can be found at the web site address, <http://www.ci.vancouver.wa.us/transportation/concurrency/index.html>.

On October 10, 2000, the Board of Clark County Commissioners also adopted a new Transportation Concurrency Ordinance and related levels of service. The County's Level of Service standards rely on meeting minimum travel speeds in each of the transportation corridors designated by the County (see Table 3-17) and/or meeting thresholds for travel delay at signalized intersections within the designated corridors. Outside of designated transportation corridors, all signalized intersections of regional significance shall achieve LOS D or better except for the intersections of SR-500/Falk Road and SR-500/NE 54<sup>th</sup> Avenue which shall achieve LOS E or better. All unsignalized intersections of regional significance in the unincorporated County shall achieve LOS E standards or better (if warrants are not met) and LOS D or better if warrants are met. For full details of the October 2000 Clark County Concurrency ordinance and travel speed standards refer to the Clark County website at <http://www.co.clark.wa.us/site/concurr/index.htm>.

**Table 3-17: Clark County Concurrency Measurement Corridors**

Corridors and Corridor Limits Description	
<b><i>North-South Roadways</i></b>	<b><i>East-West Roadways</i></b>
<b>Lakeshore Avenue</b> Bliss Rd to NE 78 <sup>th</sup> St	<b>SR-502</b> SR-503 to NE 1790 <sup>th</sup> St.
<b>Hazel Dell Avenue</b> Highway 99 to NE 63 <sup>rd</sup> St.	<b>179<sup>th</sup> Street</b> West, NW 41 <sup>st</sup> Ave. to I-5 West Central, I-5 to NE 72 <sup>nd</sup> Ave.
<b>Highway 99 &amp; NE 20<sup>th</sup> Avenue</b> NE 20 <sup>th</sup> Avenue (North), NE 179 <sup>th</sup> St. to S of NE 134 <sup>th</sup> St. Central, N of NE 134 <sup>th</sup> St. to NE 99 <sup>th</sup> St. South, NE 99 <sup>th</sup> St. to NE 63 <sup>rd</sup> St.	<b>139<sup>th</sup> St. &amp; Salmon Creek Ave.</b> 139 <sup>th</sup> Street (West), Seward Rd. to I-5 Salmon Creek Ave. (W. Central), I-5 to NE 50 <sup>th</sup> Ave.
<b>St. Johns Road</b> NE 119 <sup>th</sup> St. to NE 68 <sup>th</sup> St.	<b>119<sup>th</sup> Street</b> West, Lakeshore to Hazel Dell West Central, Hwy 99 to HNE 72 <sup>nd</sup> Ave. East Central, NE 72 <sup>nd</sup> Ave. to SR-503
<b>NE 72<sup>nd</sup> Avenue</b> SR-502 to NE 119 <sup>th</sup> St.	<b>99<sup>th</sup> Street</b> West, Lakeshore to I-5 West Central, I-5 to St. John's Rd. East, SR-503 to NE 172 <sup>nd</sup> Ave. Padden Parkway (East Central) I-205 to SR-503
<b>Andresen Road</b> NE 119 <sup>th</sup> St. to NE 58 <sup>th</sup> St.	<b>78<sup>th</sup>/76<sup>th</sup> Street</b> West, Lakeshore to I-5 West Central, I-5 to Andresen East Central, Andrsen to SR-503 East, SR-503 to Ward Rd.
<b>Gher/Covington Road</b> Padden to SR-500	<b>Fourth Plain Boulevard</b> East Central, I-205 to SR-503 East, SR-503 to 162 <sup>nd</sup> Ave.
<b>SR-503</b> North, SR-502 to NE 119 <sup>th</sup> St. South, NE 119 <sup>th</sup> St. to Fourth Plain	<b>63<sup>rd</sup> Street</b> West Central, Hazel Dell to Andresen East Central, Andresen to NE 107 <sup>th</sup> Ave.
<b>Ward Road</b> Davis Rd. to SR-500	
<b>NE 162<sup>nd</sup> Avenue</b> Ward Rd. to NE 39 <sup>th</sup> St.	
<b>NE 182<sup>nd</sup> Avenue</b> Risto Rd. to Davis Rd.	

## TRANSIT LOS STANDARDS

C-TRAN also has identified LOS standards to assess the operational quality of the transit system. The matrix outlined in Table 3-18 can be used by local jurisdictions and C-TRAN to assess whether transit system expansion would be feasible in a given area.

**Table 3-18: C-TRAN Level of Service Indicators**

C-TRAN LOS INDICATORS									
	PLANNING INDICATORS							SUPPORTING FACTORS	
Service Classes	Persons per Sq. Mile (Pop+Emp)	Peak/ Non-Peak Headways	Bus Stop Spacing	Accessibility <sup>2</sup>	Load Factor	Travel Time Ratio (transit/ auto)	Service Span (hours/day, days/week)	Expected Market Characteristics	Other Supporting Characteristics
<b>Commuter: Inter-state</b>	20,000-25,000	15/NA	major P&R lots	within 5 miles of 80% of pop+emp	1.0	1.75	M-F Peak	Portland employees who live in Washington	Parking mgmt.; HOV priority treatments; P&R spaces
<b>Commuter: Intra-state</b>	20,000-25,000	15/NA	major P&R lots	within 3 miles of 80% of pop+emp	1.0	1.75	M-F Peak	CBD & urban growth centers; employees living in Washington suburbs	Parking mgmt.; HOV priority treatments; large # of P&R spaces
<b>Urban Corridor Service</b>	18,000-20,000	15/30	1/8 mile	within 1/4 mile of 75% of rural pop+emp	1.5	2.0	7 days 12-16 hrs/day	Income, special generators, age, high density residential development	Land use zoning compatibility; parking mgmt.
<b>Urban Residential Connector Service</b>	12,000-18,000	30/60	1/4 mile	within 1/4 mile of 80% of pop+emp	1.5	2.0	5 days 12-16 hrs/day limited weekend. & evening service	Residential development connecting to major activity centers	Parking mgmt.; zoning; land use compatibility
<b>Rural</b>	Policy coverage	60/120	designated pick-up locations	within 5 miles of 75% of rural pop+emp	1.0	2.0-3.0	M-F 10-12 hrs/day ltd. weekend service	Community centers, city halls, post offices	Citizen requests for service
<b>Subscription Bus</b>	30	as needed	NA	NA	1.0	1.15	M-F Peak	Specialized employer needs	Commute trip reduction; parking mgmt.
<b>Vanpool</b>	8-15	as needed	NA	NA	1.0	1.15	M-F Peak	Specialized employer needs	Commute trip reduction; parking mgmt.
<b>C-VAN (disabled)</b>	Policy	as needed	NA	NA	1.0	NA	7 days, 12-16 hrs/day	Elderly & handicapped	NA

<sup>2</sup> Accessibility is defined as the percent of households and jobs within walking distance of a transit stop, transit center, or park and ride lot.

## **HIGHWAY SYSTEM CAPACITY ANALYSIS**

EMME/2 software is used to analyze highway system needs, in terms of capacity, for the Clark County region. Appendix A lists projects identified in the *MTP* as needed to meet existing and future forecast capacity deficiencies determined by assigning forecast 2020 trips onto the *MTP* '99 highway system as described earlier in this chapter. The list contained in Appendix A notes projects which are incorporated into the *MTP* '99 year 2020 regional travel forecasting model and as a result were considered as part of the air quality conformity analysis.

## **TRANSPORTATION SYSTEM ANALYSIS**

Highway capacity is not the only consideration in analysis of the regional transportation system. Indeed, the Intermodal Surface Transportation Efficiency Act (1991) and Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21) emphasize the need to develop alternative modes and increase capacity of the existing highway system through more efficient use by means of ridesharing, system management and transit use. Capacity expansion is to be resorted to after other alternatives have been considered. Such strategies are described in more detail in Chapter 5, System Improvement and Strategy Plan. In addition, Chapter 5 also addresses the need for maintenance and preservation of the existing regional transportation system, safety of the transportation system, development of non-motorized modes and high capacity transportation systems.